Distinguishing Between Single-Rank and Double-Rank Registered DDR DIMM Modules

Application Note (AP-727)

November 2002

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Revision History

Rev. No.	Description	Rev. Date
-001	Initial Release.	November 2002

1 Introduction

The user/system administrator may need to identify what type of memory is populated in a system using registered DDR DIMMs. This document will help in the identification of the different types of registered DDR DIMMs.

Both x4 and x8 registered DIMMs come in single-rank (single-sided) and double-rank (double-sided) configurations. A single-rank x8 ECC DDR DIMM has 9 devices on the module and comes in two different styles (see Figure 1 and Figure 2). A double-rank x4 ECC DDR DIMM has 36 devices (see Figure 5) in a stacked configuration on the module. Both the double-rank x8 ECC DDR DIMM modules and single-rank x4 ECC DDR DIMM modules have 18 devices (see Figure 3 and Figure 4) making them difficult to distinguish between (see Table 1). In the case that the memory modules have 18 devices, referring to the manufacturer's specification sheets will determine if the module is a single-rank x4 DIMM or a double-rank x8 DIMM (see Table 2). If a part number cannot be found for the DIMM, then reference to the SDRAM device (see Figure 6) for the SDRAM part number that can be used to identify the part type (see Table 3).

Table 1. Number of Devices Found on a DIMM Module

Module Type	x4 DIMM	x8 DIMM
Single-rank (single-sided)	18	9
Double-rank (double-sided)	36 (stacked)	18

Figure 1. 184-Pin Single-Rank x8 ECC DDR SDRAM DIMM (Example 1)

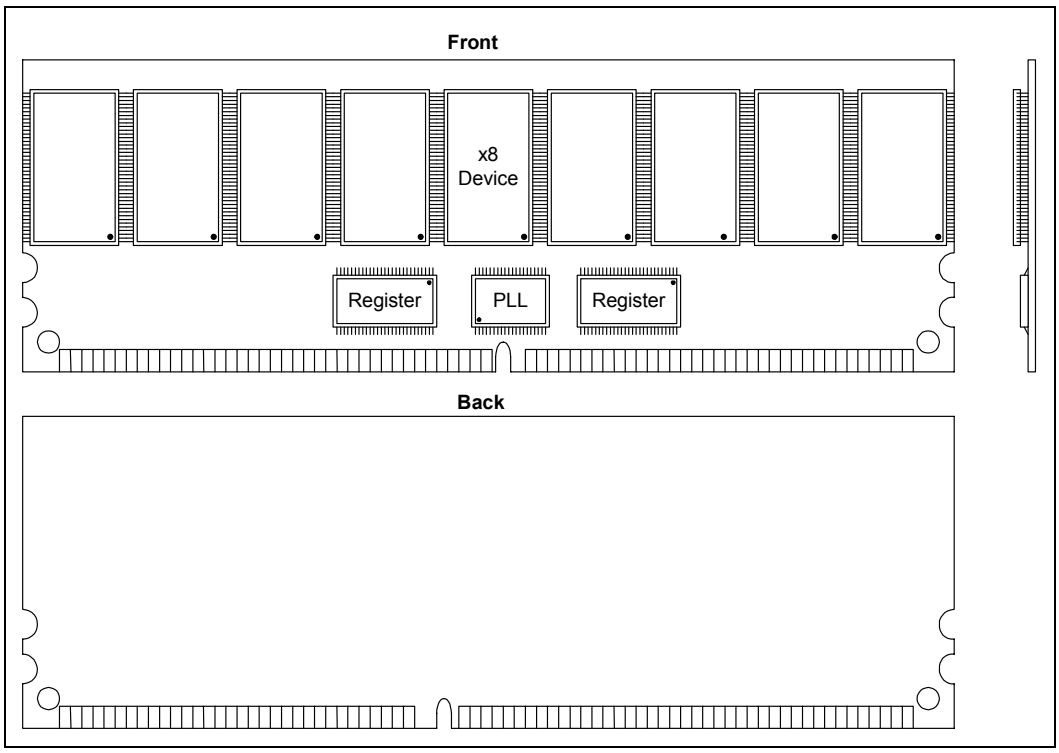

Figure 2. 184-Pin Single-Rank x8 ECC DDR SDRAM DIMM (Example 2)

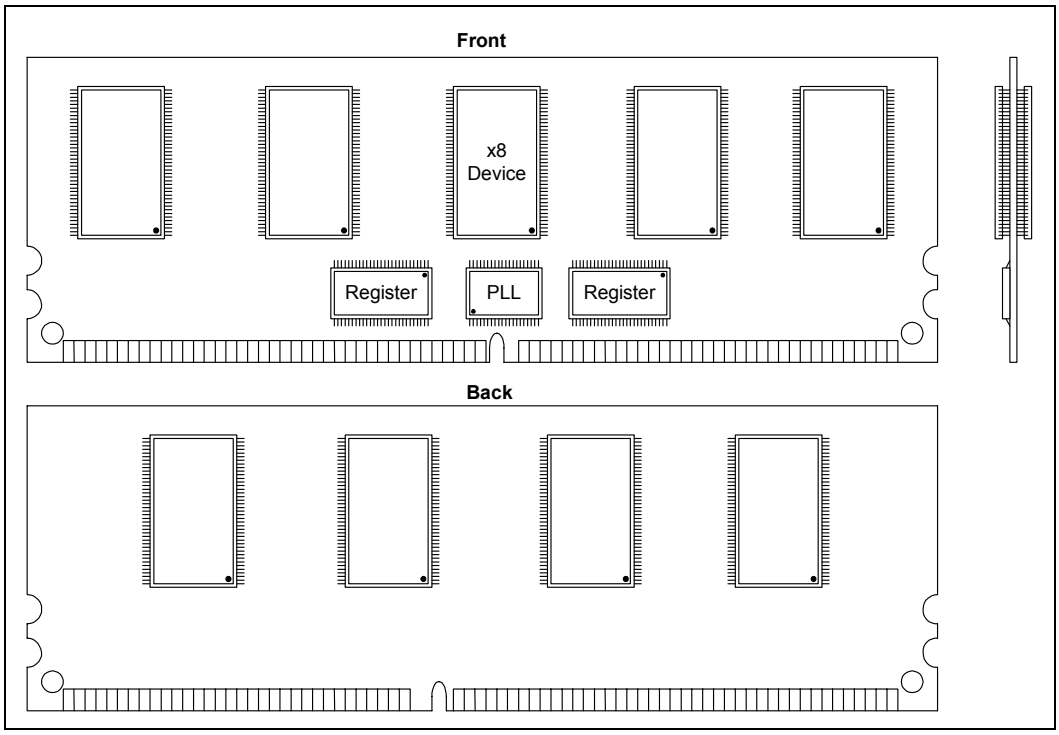

Figure 3. 184-Pin Double-Rank x8 ECC DDR SDRAM DIMM

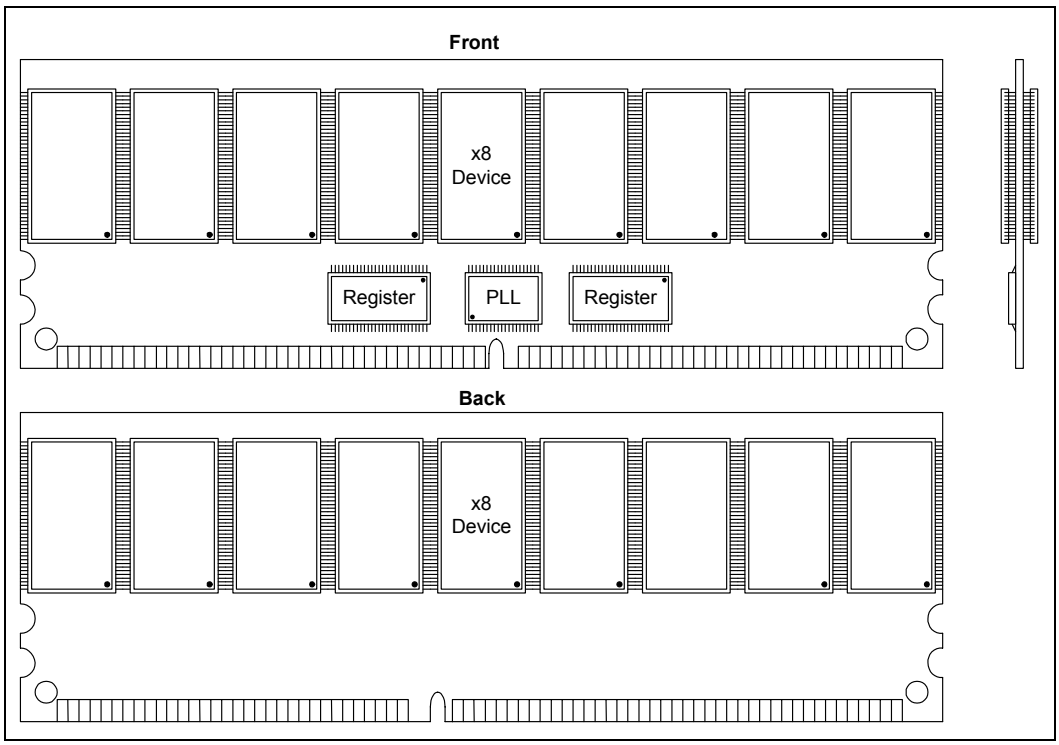

Figure 4. 184-Pin Single-Rank x4 ECC DDR SDRAM DIMM

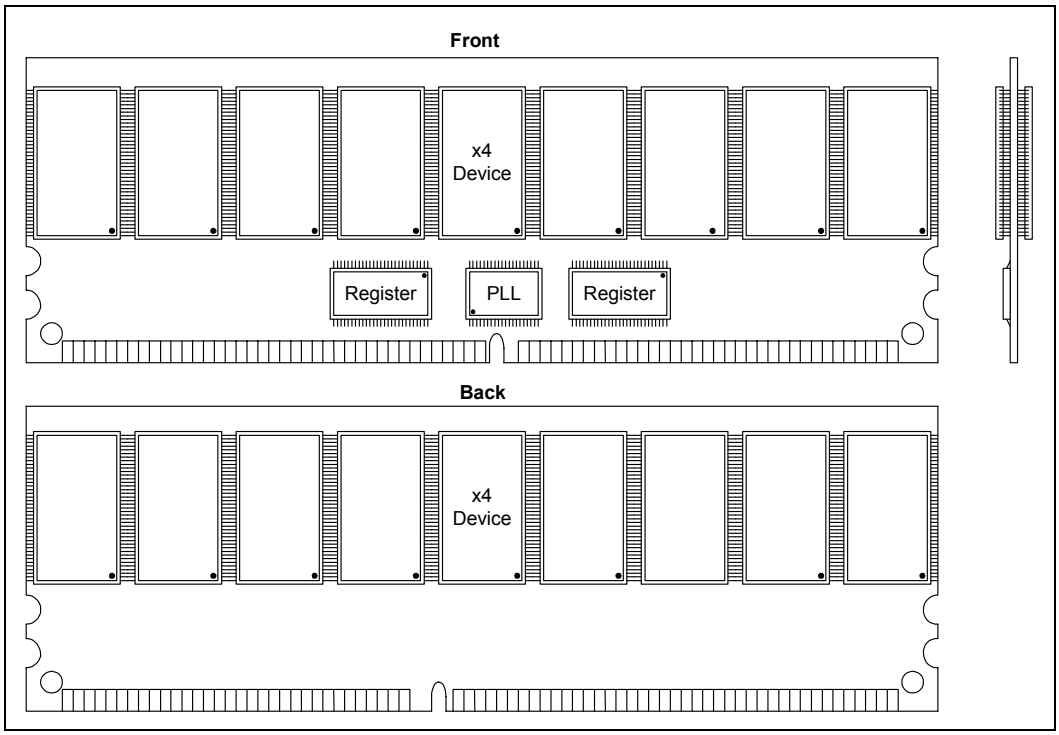

Figure 5. 184-Pin Double-Rank x4 ECC DDR SDRAM DIMM

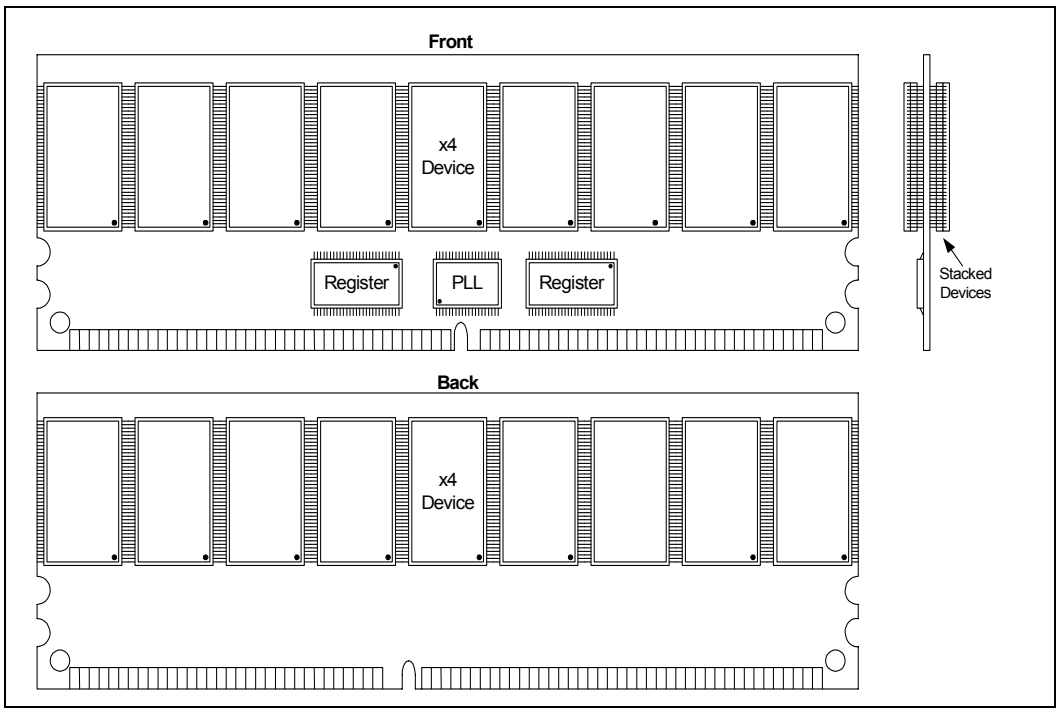

Table 2. Example Datasheet Table to Find Device Type for a 128 MB and 256 MB x8 DIMM

Parameter	128 MB	256 MB
Refresh Count	4K	8K
Row Addressing	4K (A0–A11)	8K (A0–A12)
Device Bank Addressing	4 (BA0, BA1)	4 (BA0, BA1)
Device Type	16 Meg x8	32 Meg x8
Column Addressing	1K (A0–A9)	1K (A0–A9)
Module Bank Addressing	1 (S0#)	1 (S0#)

Figure 6. SDRAM Part Number Location

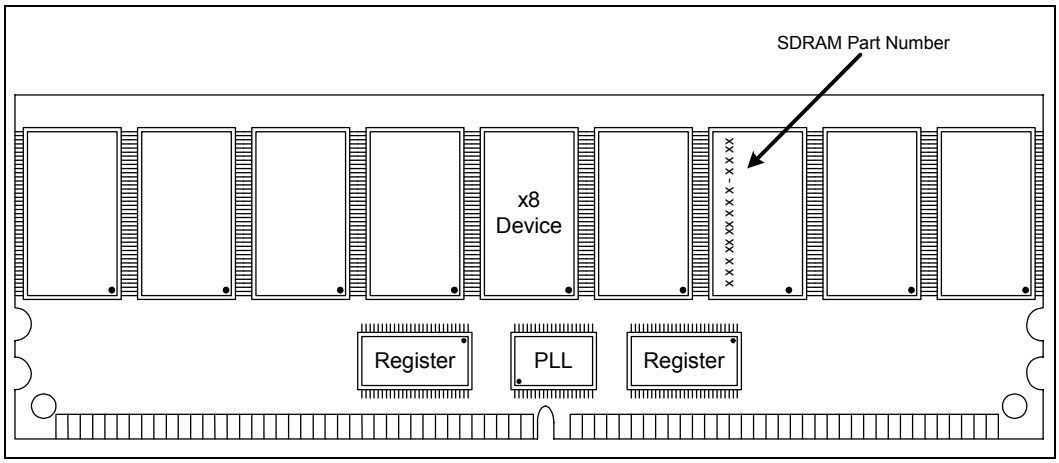

Table 3. Example Datasheet Table to Find Device Specifications for 64 MB x4 SDRAM

Part Number	Configuration	Timing
x x xx xx x x x – x x xx	64 Meg x4	133 MHz w/ CL=2